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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No: 09/768,845 Docket No: 2011001
Filing Date: 01/23/01 Applicant: HO et al.
Examiner: LUAN THAI Art Unit: 2827
Title PACKAGING STRUCTURE OF IMAGE SENSOR AND
METHOD FOR PACKAGING THE SAME
To: THE ASSISTANT COMMISSIONER FOR PATENTS
Washington, D.C. 20231
Subject: Request for Continued Examination (RCE) in response to Office
Action dated 07/12/2002

RESPONSE TO OFFICE ACTION

Dear Sir:

In response to the Office Action dated 07/12/2002, Applicant submits the
5 following amendments and remarks.

AMENDMENTS

IN THE CLAIMS:

Please amend claim 1 as follows:

10 1. (Twice Amended) 1. A packaging structure of an image sensor,
comprising:

B 1
15 a substrate including a plurality of straight metal sheets directly penetrating
through the substrate, glue for sealing the metal sheets after the metal sheets are
formed, a first surface having a periphery, and a second surface opposite to the
first surface, the metal sheets being exposed to the outside via the first surface and
the second surface to form first contacts and second contacts, respectively;

a projecting edge provided on the periphery of the first surface of the
substrate to form a concavity above the substrate;

20 an image sensing chip mounted on the substrate and within the concavity, a
plurality of bonding pads being formed on the image sensing chip;

Amended
B1 5
a plurality of wirings electrically and directly connecting the bonding pads of the image sensing chip to the first contacts of the first surface of the substrate in order to electrically connect the image sensing chip to the substrate, so that electrical signals from the image sensing chip are capable of being transmitted to the second contacts of the second surface of the substrate; and

a transparent layer arranged on the projecting edge on the first surface of the substrate so that the image sensing chip is capable of receiving optical signals.

Please amend claim 6 as follows:

10 6. (Twice Amended) A method for packing an image sensor, comprising the steps of:

15 B2
preparing a substrate including a plurality of straight metal sheets directly penetrating through the substrate, glue for sealing the metal sheets after the metal sheets are formed, a first surface having a periphery, and a second surface opposite to the first surface, the metal sheets being exposed to the outside via the first surface and the second surface to form first contacts and second contacts, respectively;

providing a projecting edge on the periphery of the first surface of the substrate to form a concavity above the substrate;

20 mounting an image sensing chip having a plurality of bonding pads onto the first surface of the substrate and within the concavity;

directly connecting the bonding pads of the image sensing chip to the first contacts of the first surface of the substrate by a plurality of wirings; and

25 mounting a transparent layer on the projecting edge located on the first surface of the substrate in order to cover the image sensing chip.

REMARKS/ARGUMENTS

Claims 1-11 remain in this application. Claims 1 and 6 have been amended.

Claims 1 and 6 have been amended for the following reasons:

1. Is the wire directly connected to the via?

In Glenn's patent, the wire 208 *is not directly* connected to the via 203. Instead, the wire 208 is connected to the via 203 through the metalization 204.
5 However, in this application, the wiring 15 *is directly* connected to the straight metal sheet 16. If it is possible to for the wire 208 to connect to the via 203, the metalization 204 may be omitted. However, Glenn does not teach or motivate one of ordinary skill in the art to remove the metalization 204. Instead, Glenn said that the metalization 204 may be formed in a conventional manner, for
10 example, by masking and etching copper or other conductive layers formed on substrate 20 (col. 4, lines 31-33). Therefore, it is difficult to believe that Glenn has motivated this application to do this change.

Since the metalization 204 has to be formed in Glenn's patent, additional processes have to be added. Accordingly, the manufacturing cost may be
15 increased.

2. Is the glue formed after the metal sheets (vias) are formed?

In the amended claims of this application, the glue is formed *after* the metal sheets are formed. However, in the Glenn's patent, the glue is formed *before* the
20 vias are formed. Glenn said that "Such vias may be formed, for example, by drilling holes in substrate 200, and plating the drilled holes with metal, such as copper (col. 3, lines 53-55)". Please also refer to col. 3, lines 33-37 of Glenn's patent, it can be understood that the glue (e.g. BT) is formed before the vias are formed.

25 Furthermore, Glenn does not teach or motivate one of ordinary skill in the art to form the glue after the metal sheets are formed. It is believed that using the tape to position the straight metal sheets and then sealing the sheets with the glue are different from any of the prior arts.

Attached hereto is a marked-up version of the changes made to the claims
30 by the current amendments. The attached page is captioned "Version with markings to show changes made."

In light of the above amendments and remarks, Applicant now asserts that all of the grounds for rejection have been traversed or overcome by amendments, and that all of the present claims are in condition for immediate allowance. Applicant therefore requests reconsideration of the objections and rejections, and
5 solicits allowance of the present claims at an early date.

Thank you for your consideration.

Respectfully submitted,

Date: 8/29. 2002

Burton Yang
Burton Yang

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Title of Officer: Manager of Kingpak Technology Inc.,
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